Claims:

1. A super conductive magnet apparatus comprising,

a super conductive coil,

a helium containing volume for containing therein liquid helium to keep a temperature of the super conductive coil low, and

a vacuum vessel containing therein the super conductive coil and the helium containing volume,

wherein the super conductive magnet apparatus further comprises a support body on which the super conductive coil is arranged, a container cover forming the helium containing volume with the support body in such a manner that a thermal energy is capable of being transmitted between the super conductive coil and the liquid helium, and a connecting member connecting the support body to the vacuum vessel so that the support body is supported through the connecting member on the vacuum vessel.

2. A super conductive magnet apparatus according to claim 1, wherein the super conductive coil is capable of generating a magnetic force in such a manner that a tensile stress is generated longitudinally in the connecting member by the magnetic force.

3. A super conductive magnet apparatus according to claim 1, wherein the connecting member extends through the liquid helium in the containing volume.

4. A super conductive magnet apparatus according

to claim 1, wherein the connecting member extends through the container cover to the vacuum vessel.

5. A super conductive magnet apparatus according to claim 4, wherein the connecting member includes a monolithic part thereof extending between inside and outside of the container cover.

6. A super conductive magnet apparatus according to claim 1, wherein the thermal energy is capable of being transmitted through the support body between the super conductive coil and the liquid helium while the liquid helium is prevented from contacting the super conductive coil.

7. A super conductive magnet apparatus according to claim 1, wherein the thermal energy is capable of being transmitted between the super conductive coil and the liquid helium contacting the super conductive coil.

8. A super conductive magnet apparatus according to claim 1, wherein the super conductive coil is wound on the support body.

9. A super conductive magnet apparatus according to claim 1, further comprising a shield surrounding the super conductive coil and the helium containing volume, and surrounded by the vacuum vessel.

10. A super conductive magnet apparatus according to claim 9, wherein the shield includes one of aluminum and austenitic stainless steel as a main component thereof.

11. A super conductive magnet apparatus according

to claim 1, wherein the super conductive magnet apparatus comprises a pair of the super conductive coils one of which super conductive coils is surrounded by the other one of the super conductive coils as seen in a common axial direction of the super conductive coils.

12. A super conductive magnet apparatus according to claim 11, wherein the connecting member extends between the super conductive coils as seen in the common axial direction of the super conductive coils.

13. A super conductive magnet apparatus according to claim 11, wherein the super conductive coils overlap each other at least partially as seen in a transverse direction perpendicular to the common axial direction.

14. A super conductive magnet apparatus according to claim 11, wherein the support body includes first and second support body parts on which the super conductive coils are respectively wound, and the first and second support body parts are discrete from each other to be separable from each other.

15. A super conductive magnet apparatus according to claim 14, wherein the first and second support body parts have respective surfaces facing to each other in a transverse direction perpendicular to the common axial direction in such a manner that the first and second support body parts are capable of being positioned with respect to each other in the transverse direction by a contact between the surfaces.

16. A super conductive magnet apparatus according to claim 14, wherein the first and second support body parts are separable from each other along at least one face extending in a transverse direction perpendicular to the common axial direction.

17. A super conductive magnet apparatus according to claim 3, wherein a part of the connecting member extending through the liquid helium includes austenitic stainless steel as a main component thereof.

18. A super conductive magnet apparatus according to claim 1, wherein the support body has a fluidal path fluidly communicating with the helium containing volume and covered by a part of the connecting member so that the part the connecting member is fluidly communicating with the helium containing volume.

19. A super conductive magnet apparatus according to claim 1, wherein the support body includes austenitic stainless steel as a main component thereof.

20. A magnetic resonance imaging machine comprising the super conductive magnet apparatus according to claims 1.